

Remarks:

Reconsideration of the application is respectfully requested.

Claims 1 - 29 and 31 - 41 are presently pending in the application. Claims 24 - 29 and 31 - 41 are subject to examination and claims 1 - 23 have been withdrawn from examination. As it is believed that the claims were patentable over the cited art in their original form, the claims have not been amended to overcome the references.

On page 2 of the above-identified Office Action, claims 24 - 29 and 31 - 41 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over U. S. Patent No. 6,515,255 to Jiang et al ("JIANG") in view of U. S. Patent No. 6,548,598 to Takeuchi et al ("TAKEUCHI") and U. S. Patent No. 5,049,980 to Saito et al ("SAITO").

Applicants respectfully traverse the above rejections.

More particularly, as stated in the response to the previous Office Action, Applicants' independent claims 24, 31, 33, and 40 recite, among other limitations:

said first plastic layer having a bead of plastic compound of said first plastic layer surrounding the marginal sides of the semiconductor chip; [emphasis added by Applicants]

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The language of the claims 24, 31, 33 and 40 make clear that the "bead" of the invention of the instant application refers to a form of the first plastic layer rather than to an additional bead, such as a glass filler bead, which has been added to the first plastic layer. The noun "bead" is defined in the Merriam Webster Online Dictionary (www.merriamwebster.com), as follows:

Main Entry: ¹bead
Pronunciation: 'bEd
Function: noun
Etymology: Middle English bede prayer, prayer bead, from Old English *bed*, *gebed* prayer; akin to Old English *biddan* to entreat, pray -- more at BID
1 a obsolete : PRAYER -- usually used in plural b plural : a series of prayers and meditations made with a rosary
2 : a small piece of material pierced for threading on a string or wire (as in a rosary)
3 plural a : ROSARY b : a necklace of beads or pearls
4 : a small ball-shaped body: as a : a drop of sweat or blood b : a bubble formed in or on a beverage c : a small metal knob on a firearm used as a front sight d : a blob or a line of weld metal
5 : a projecting rim, band, or molding

It is clear from the specification of the instant application that the term "bead" used herein, conforms with the definition of "a line of weld metal" (even though Applicants claim a bead of plastic, not metal) or "a projecting rim, band, or molding". This is supported by the specification of the instant application, for example, on page 4, lines 13 - 17, which states:

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On a carrier plate of this type and/or a first plastic layer of this type, a semiconductor chip is then fitted in the respective component position, forming a bead of plastic embedding compound which surrounds the marginal sides of the semiconductor chip.

Applicants' claims 24, 31, 33 and 40 additionally specify that the bead surrounds the marginal sides of the semiconductor chip. See also page 8 of the instant application, lines 2 - 4, which state:

Instead, part of the marginal side height of the semiconductor chip is wetted by the plastic embedding compound of the first plastic layer, forming a bead around the semiconductor chip.

See also, page 27 of the instant application, lines 1 - 9, which states:

A bead 10 of plastic embedding compound of the first plastic layer 7 surrounds the semiconductor chip 5 in its marginal region at the sides 18. This bead 10 is formed as the semiconductor chip 5 is introduced with its passive rear side 17 into the upper region 9 of the first plastic layer 7. The bead 10 wets the marginal sides 18 in their lower regions and ensures that the semiconductor chip 5 is fixed in the first plastic layer 7 at one of the component positions 4 of the blank 1. [emphasis added by Applicants]

As such, the term "bead", as can be seen from the instant application, refers to a line of weld or a molding.

Thus, Applicants' claims 24, 31, 33 and 40 require, among other limitations: 1) a bead of plastic compound of said

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first plastic layer; and 2) a bead of plastic compound
surrounding the marginal sides of the semiconductor chip.

Applicants believe that none of the prior art references of record teach or suggest, among other limitations, Applicants' particularly claimed bead of plastic compound of the first layer of claims 24, 31, 33 and 40.

In response to Applicants' previous arguments to this effect, the Office Action stated on pages 10 - 11, in part:

Applicants argue that "The language of the claims of the instant application has been modified to clarify that the 'bead' of the invention of the instant application refers to a form of the first plastic layer rather than to an additional bead such as a glass filler bead, which has been added to the first plastic layer. . . . Note that Takeuchi discloses that one of the bead material is fluorine resin/polymer, therefore the beads of Takeuchi are also plastic compound of the first plastic layer. As stated above in the office action, Takeuchi discloses adding glass/polymer beads to the thermoplastic resin which is the identical plastic material in the first plastic layer of the instant invention [col. 7, lines 32-50].

Applicants respectfully disagree with the allegation in the Office Action that TAKEUCHI discloses Applicants' particularly claimed bead of plastic compound of said first plastic layer, and reiterates that none of the cited references, alone or in combination, teaches or suggests, a first plastic layer having

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a bead of plastic compound of said first plastic layer
surrounding the marginal sides of the semiconductor chip.

More particularly, in the above-quoted Response to Arguments section of the Office Action, it is argued that TAKEUCHI "discloses that one of the bead material is fluorine resin/polymer", so that the bead in TAKEUCHI is "also plastic compound of the first plastic layer". Applicants respectfully disagree.

Col. 7 of TAKEUCHI, lines 32 - 53, states:

So long as the object of the invention is not impeded, the thermoplastic resin composition of the invention may also contain various additives, if necessary, including stabilizers such as antioxidants, weather resistant agents, metal inactivating agents, photostabilizers, ultraviolet absorbers, thermostabilizers and copper inhibitors; bactericides and fungicides, dispersing agents, softening agents, plasticizers, silicon oil, flame retardants, crosslinking agents, co-crosslinking agents, vulcanizing agents, vulcanizing aids, foaming agents, foaming aids, coloring agents such as titanium oxide and carbon black, metal powders such as ferrite, inorganic fibers such as glass fibers and metal fibers, organic fibers such as carbon fibers and aramid fibers, composite fibers, inorganic whiskers such as potassium titanate whiskers, fillers such as glass beads, glass balloons, glass flakes, asbestos, mica, zeolite, calcium carbonate, talc, silica, calcium silicate, hydrotalcite, kaolin, diatomaceous earth, graphite, pumice, Ebo powder, cotton flock, cork powder, barium sulfate, fluorine resin, polymer beads and the like, or mixtures thereof, other fillers such as polyolefin wax, cellulose powder, rubber powder, and low molecular weight polymers.

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As stated clearly in TAKEUCHI this section (pointed to in the Office Action) discloses compounds which may be used as additives in the resin of TAKEUCHI. The additives disclosed in TAKEUCHI have a wide range of forms, for example, fibers, flakes, balloons, powders, etc., which supports the direct statement in TAKEUCHI, that these materials are additives. As additives, they are of a different material from the thing to which they are being added. For example, the Merriam Webster Online Dictionary (www.merriamwebster.com) defines the noun form of additive, as follows:

Main Entry: ²additive

Function: noun

: a substance added to another in relatively small amounts to effect a desired change in properties <food additives> [emphasis added by Applicants]

An additive is defined as a substance added to another. Clearly, an additive is of a different substance from that to which it is added. This is directly contrary to the statement made on page 3 of the Office Action alleging that "Takeuchi discloses adding glass/polymer beads to the thermoplastic resin which is the identical plastic material in the first plastic layer of the instant invention". TAKEUCHI does not, in fact, disclose adding an identical plastic material to the plastic layer, but discloses using polymer beads as an additive, which is inherently and explicitly defined as being a different substance from the thing to which it is added.

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As such, in TAKEUCHI, the additives disclosed in col. 7, lines 32 - 53 are materials that must inherently be of a different material than the resin to which they are included. As such, TAKEUCHI, as with the other cited references, fails to teach or suggest a first plastic layer having a bead of plastic compound of the first plastic layer.

Further, the addition of a polymer bead to a plastic material, as disclosed in TAKEUCHI, neither teaches, nor suggests, the formation of a bead (i.e., a line of weld or molding) surrounding the marginal sides of the semiconductor chip, wherein the bead is made of the same material as a first plastic layer. As such, Applicants' claims 24, 31, 33 and 40 are believed patentable over TAKEUCHI alone, or in combination with JIANG and SAITO.

In addition to failing to disclose a bead of plastic material of the first plastic layer, the combination of TAKEUCHI, JIANG and SAITO additionally fails to teach or suggest, among other limitations, the bead of the plastic material of the first plastic layer surrounding the marginal sides of the semiconductor chip. As claims 24, 31, 33 and 40 require the bead (i.e., line of weld or molding) to surround "the marginal sides" (i.e., "sides" being plural), the use of the plural

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clearly indicating that a bead should surround two or more
marginal sides of the semiconductor chip. This is neither
taught nor suggested by any of the TAKEUCHI, JIANG and SAITO
references.

Further, as the technical advantage of providing a bead
surrounding the marginal sides is not recognized in the prior
art documents, a person of ordinary skill in the art would not
have been provided with any teaching, suggestion or motivation
to provide such a feature. As such, the invention of
Applicants' claims 24, 31, 33 and 40 would not be obvious in
view of the cited prior art.

Further, Applicants believe that a person of ordinary skill in
the art would not think to combine the TAKEUCHI, JIANG and
SAITO references, as was done in the Office Action. Rather,
the TAKEUCHI, JIANG and SAITO references relate to completely
different types of electronic components. For example, JIANG
discloses a passivation layer for packaged integrated circuits
of a board-on-chip device. In such a device, the contact pads
of the active surface of the chip are electrically connected
to contact pads on the board by bond wires positioned through
the bonding channel of the board.

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In contrast to JIANG, SAITO discloses the fabrication of a wiring layer on a panel which comprises a plurality of embedded semiconductor chips. As such, Applicants' believe that a person of ordinary skill in this art would not have combined JIANG and SAITO.

Further, the structure of SAITO is not transferable to the package of JIANG without considerable, and inventive, modification. As such, even if a person of ordinary skill in the art were to consider JIANG and SAITO in combination, Applicants' invention of claims 24, 31, 33 and 40 would not be obvious absent impermissible hindsight reconstruction.

Further, the TAKEUCHI reference discloses a thermoplastic resin composition which may be used in the fields of food wrapping containers, trays, sheets, tubes, films, fibers, laminates, coating materials, electric and electronic parts such as printed circuit boards, chassis for OA devices and household appliances such as computers, and industrial parts such as automobile parts, precision parts and construction materials. See col. 1 of TAKEUCHI, lines 61 - 67. TAKEUCHI however, fails to teach or suggest that the thermoplastic resin of that reference could be used for embedding a semiconductor chip. Rather, such a use for the thermoplastic resin of TAKEUCHI would not be obvious from reading that

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reference. As such, Applicants believe that a person of ordinary skill in the art would not have considered using the resin TAKEUCHI when looking to provide an improved multi-layer embedding compound. Further, nothing in TAKEUCHI would suggest modifying JIANG and SAITO as suggested in the Office Action.

Obviousness can only be established by combining or modifying the teachings of the prior art to produced the claimed invention where there is some teaching, suggestion or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. Such teaching, suggestion or motivation for combining JIANG with SAITO and TAKEUCHI is absent in the instant case.

It is accordingly believed that none of the references, whether taken alone or in any combination, teach or suggest the features of claims 24, 31, 33 and 40. Claims 24, 31, 33 and 40 are, therefore, believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claims 24 or 33.

In view of the foregoing, reconsideration and allowance of claims 1 - 29 and 31 - 41 are solicited.

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In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate receiving a telephone call so that, if possible, patentable language can be worked out. In the alternative, the entry of the amendment is requested, as it is believed to place the application in better condition for appeal, without requiring extension of the field of search.

If an extension of time for this paper is required, petition for extension is herewith made.

Please charge any fees that might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner Greenberg Sterner LLP, No. 12-1099.

Respectfully submitted,



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